

WHAT IS CLAIMED IS

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1. A retransmission control method for a multicast information distribution service which distributes multicast information with respect to a plurality of wireless terminals within a service  
10 area from an information distribution apparatus via a wireless region, comprising the steps of:

(a) transmitting a retransmission request for information which requires retransmission, from an arbitrary wireless terminal to the information  
15 distribution apparatus, at a timing determined by the wireless terminal when the information which requires retransmission is generated;

(b) after receiving the retransmission request for the information from the arbitrary wireless  
20 terminal within the service area, notifying retransmission information indicating the information requested by the retransmission request with respect to each of the wireless terminals within the service area from the information  
25 distribution apparatus, and retransmitting the information requested by the retransmission request from the information distribution apparatus at a predetermined timing; and

(c) making no retransmission request for the  
30 information from each of the wireless terminals if the retransmission information is received by each of the wireless terminals before the predetermined timing, so that each of the wireless terminals receives the information retransmitted from the  
35 information distribution apparatus at the predetermined timing.

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2. The retransmission control method for the multicast information distribution service as claimed in claim 1, further comprising the step of:

(d) intensively managing in the information distribution apparatus retransmission requests for the same information made with respect to the same multicast information distribution service until the predetermined timing, and retransmitting from the information distribution apparatus information related to intensively managed retransmission requests at the predetermined timing.

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3. The retransmission control method for the multicast information distribution service as claimed in claim 1, further comprising the steps of:

(d) including information related to the predetermined timing at which the information requested by the retransmission request is retransmitted in the retransmission information, and notifying each of the wireless terminals within the service area from the information distribution apparatus information related to a transmission channel and a transmission timing for notifying the retransmission information and information related to a transmission channel for retransmitting the information requested by the retransmission request; and

(e) receiving the retransmission information by each of the wireless terminals within the service area based on the information which is received from the information distribution apparatus and is related to the transmission channel and the transmission timing for notifying the retransmission information, and receiving the information

retransmitted from the information distribution apparatus based on the information related to the transmission channel for retransmitting the information and the information related to the predetermined timing included in the retransmission information which are received from the information distribution apparatus.

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4. The retransmission control method for the multicast information distribution service as claimed in claim 1, further comprising the step of:

15 (d) managing the information requested by the retransmission request in categories according to a predetermined rule, and managing timings for retransmitting the information for each of the categories, in the information distribution apparatus.

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5. The retransmission control method for the multicast information distribution service as claimed in claim 1, further comprising the step of:

25 (d) controlling an upper limit value of a number of retransmissions of the information requested by the retransmission request depending on the multicast information which is distributed from the information distribution apparatus.

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6. A retransmission control system for a

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multicast information distribution service which distributes multicast information with respect to a plurality of wireless terminals within a service area from an information distribution apparatus via  
5 a wireless region, comprising:

timing determination means, in each wireless terminal, for determining a timing at which a retransmission request for information which requires retransmission is to be transmitted when  
10 the information which requires retransmission is generated;

first retransmission control means, in each wireless terminal, for transmitting the retransmission request for the information with  
15 respect to the information distribution apparatus at the timing determined by said timing determination means;

retransmission control information managing means, in the information distribution apparatus,  
20 for managing retransmission information indicating the information requested by the retransmission request after receiving the retransmission request for the information from an arbitrary wireless terminal within the service area; and

25 second retransmission control means, in the information distribution apparatus, for transmitting information related to the retransmission request indicated by the retransmission information to each wireless terminal within the service area at a  
30 predetermined timing,

wherein each wireless terminal makes no retransmission request for the information by the first retransmission control means if the retransmission information is received before the  
35 timing determined by said timing determination means, so that each wireless terminal receives the information retransmitted from the information

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distribution apparatus at the predetermined timing.

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7. The retransmission control system for the multicast information distribution service as claimed in claim 6, further comprising:

10 distribution information managing means, in the information distribution apparatus, for intensively managing retransmission requests for the same information made with respect to the same multicast information distribution service until the predetermined timing,

15 said second retransmission control means retransmitting information related to the retransmission requests intensively managed by said distribution information managing means at the predetermined timing.

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8. The retransmission control system for the multicast information distribution service as claimed in claim 6, wherein:

25 information which is related to the predetermined timing at which the information requested by the retransmission request is retransmitted, is included in the retransmission information,

30 said information distribution apparatus notifies each of the wireless terminals within the service area information related to a transmission channel and a transmission timing for notifying the retransmission information and information related to a transmission channel for retransmitting the

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information requested by the retransmission request,  
by the second retransmission control means, and

5       said first retransmission control means in each  
wireless terminal receives the retransmission  
information based on the information which is  
received from the information distribution apparatus  
and is related to the transmission channel and the  
transmission timing for notifying the retransmission  
information, and receives the information  
10   retransmitted from the information distribution  
apparatus based on the information related to the  
transmission channel for retransmitting the  
information and the information related to the  
predetermined timing included in the retransmission  
15   information which are received from the information  
distribution apparatus.

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9. The retransmission control system for  
the multicast information distribution service as  
claimed in claim 6, further comprising:

managing means, in the information distribution  
25   apparatus, for managing the information requested by  
the retransmission request in categories according  
to a predetermined rule, and managing timings for  
retransmitting the information for each of the  
categories.

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10. The retransmission control system for  
35   the multicast information distribution service as  
claimed in claim 6, further comprising:

retransmission control information managing

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12. The retransmission control apparatus as claimed in claim 11, further comprising:

distribution information managing means for intensively managing retransmission requests for the same information with respect to the same multicast information distribution service until the predetermined timing is reached,

said retransmission control means retransmitting information related to the retransmission requests intensively managed by said distribution information managing means at the predetermined timing.

13. The retransmission control apparatus as claimed in claim 11, wherein:

information which is related to the predetermined timing at which the retransmission of the information requested by the retransmission request is made, is included in the retransmission information,

the retransmission control means notifies each of the wireless terminals within the service area information related to a transmission channel and a transmission timing for notifying the retransmission information and information related to a transmission channel for retransmitting the information requested by the retransmission request, so that each of the wireless terminals within the service area receives the information which is retransmitted, based on the information included in the retransmission information and the information which is notified by said retransmission control means.



14. The retransmission control apparatus as claimed in claim 11, further comprising:

managing means for managing the information requested by the retransmission request in

5 categories according to a predetermined rule, and managing timings for retransmitting the information for each of the categories.

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15. The retransmission control apparatus as claimed in claim 11, further comprising:

retransmission control information management

15 control means for controlling an upper limit value of a number of retransmissions of the information requested by the retransmission request depending on the multicast information which is distributed.

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16. A wireless terminal which receives multicast information distributed from an information distribution apparatus via a wireless region, and receives information retransmitted from the information distribution apparatus according to a retransmission control, comprising:

25 timing determination means for determining a timing for transmitting a retransmission request for information which requires retransmission; and

30 retransmission control means for transmitting the retransmission request for the information with respect to the information distribution apparatus at the timing determined by said timing determination means,

said retransmission control means making no

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information which is related to the predetermined timing at which the information requested by the retransmission request is retransmitted, is included in the retransmission information, and

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area, comprising:

notifying means for notifying retransmission information which indicates that predetermined information is requested by a retransmission request to each of the wireless terminals within the service area, in response to the retransmission request from an arbitrary wireless terminal within the service area.

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19. The wireless base station as claimed in claim 18, further comprising:

retransmitting means for retransmitting the predetermined information requested by the retransmission request to each of the wireless terminals within the service area, at a timing which can be set arbitrarily.

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20. The wireless base station as claimed in claim 19, wherein said retransmitting means copes with one retransmission of the predetermined information with respect to a plurality of retransmission requests which request the predetermined information, if the retransmission request requesting the predetermined information is received from one or more wireless terminals within the service area before the predetermined information is retransmitted to each of the wireless terminals within the service area.

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21. A wireless terminal which is usable within an arbitrary service area, comprising:

retransmission request means for making a retransmission request with respect to a wireless  
5 base station when predetermined information which requires retransmission is generated; and

control means for discontinuing transmission of the retransmission request for the predetermined information from said retransmission request means  
10 when notified of retransmission information which indicates that a retransmission request for the predetermined information is made from another wireless terminal within the arbitrary service area at a timing before said retransmission request means  
15 makes the retransmission request.

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